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ABSTRACT

Program advisory committees in vocational education have traditionally been charged with the responsibility of evaluating programs for the purpose of keeping them up to date with business and industry practices and current technology. Rapid technological development and accountability requirements have led to state mandates that the advisory committee evaluation be given closer attention. Through an evaluation of the literature and practice, it was learned that there is a lack of systematic methodologies for advisory committees to use in evaluating programs. The Program Advisory Committee Evaluation System (PACES) was developed to fill this gap. The PACES model was developed through a systems approach to the problem. The model was conceptualized through analysis and synthesis of existing information about vocational education, program advisory committees, program evaluation, and systems design. The model was validated through critical examination by recognized experts and practitioners and through tests of operational feasibility conducted in schools. The model consists of four major functions or subsystems: advisory committee training, data gathering, data organization, and analysis and communication of findings. The system is designed to enable advisory committees to evaluate programs on factors found to be within the realm of expertise of advisory committee members, excluding factors that belong to the realm of school, district, and state administrators. When properly implemented, the PACES system should provide vocational education program operators with information related to the needs of the businesses and industries who employ program completers, so that they can make program decisions from an informed base. A six-page reference list is appended. (KC)

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ADVISORY COMMITTEE EVALUATION OF VOCATIONAL EDUCATION PROGRAMS

by

William T. Orr, Jr., Ed.D.

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F.E.R.D.C. NOTES ON THIS EDITION

This edition was edited by Dr. John Hilderbrand, Director of Testing and Evaluation, Hillsborough County Public Schools and the selected organization of the content is the product of his labors. Florida Educational Research & Development Council, Inc. is happy to publish this research by William T. Orr especially because it is in the field of vocational education and because it emphasizes the need for an effective way to involve the employers of vocational graduates in influencing and effecting the curriculum decisions made in vocational education. Such involvement models will serve to upgrade and modernize the curriculum. The results should help to assure a better educated and more effective worker for the work force, so essential to the free enterprise system and the democratic political system.

Charlie T. Council
Executive Secretary

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THE PROBLEM AND ITS CONTEXT

Vocational education is intended to train workers who can enter business and industry with the skills necessary to perform the tasks for which they are hired. As mechanization, automation, and computerization increase in the marketplace, these skills accelerate in complexity. Public vocational education, faced with the immense costs of new equipment and new training for instructors, encounters new difficulties in keeping up with the rapidly increasing technology.

One of the prevailing methods that has been used to keep vocational training programs consistent with the needs of business and industry is the advisory committee. Program advisory committees, made up of representatives of the employing organizations served by vocational education, are in a unique position to evaluate programs and to offer recommendations for meeting the needs identified. Advisory committees have long been a part of vocational education. Their use in evaluation is well grounded in the literature and in practice (Cochran, et al., 1980; Florida State Advisory Council on Vocational and Technical Education (FSACVTE), 1979a; FSACVTE, 1979b; Wentling, 1980). In Florida, however, there is no systematic methodology to enable these committees to provide administrators with the data needed to make sound decisions. The purpose of this paper is the development of a model for an evaluation system in which the program advisory committees can communicate information to program decision makers.

Though evaluation of instructional programs is not a new concept, only recently have efforts been made to establish a comprehensive evaluation rationale and methodology (Worthen and Sanders, 1973; Popham, 1975; Wolf, 1979). Accountability has been largely responsible for the emphasis on program evaluation over the last two decades (Popham, 1975; Kimbrough and Nunnery, 1976; Tanner and Tanner, 1975). This focus on accountability has been seen as symptomatic of a general scarcity of research-based knowledge and information-based decision making in the field (Kimbrough and Nunnery, 1976).

Program evaluation is conducted for the purposes of improving on-going programs and developing new programs (Cronbach, 1963; Popham, 1975; Wolf, 1979). These purposes for evaluating programs are the most often cited reasons for the development of systematic

evaluation models (Worthen and Sanders, 1973; Popham, 1975; Tanner and Tanner, 1975; Alkin, Daillak and White 1979).

The use of program evaluation is imbedded in the context of knowledge utilization and data-based program decision making. Using evaluation in data-based decision making has been seen as the primary reason for conducting it (Alkin, et al., 1979; Wentling, 1980).

Whether evaluation findings are used or whether they are simply filed and forgotten is a question of considerable concern. One body of thought contends that evaluation is of questionable utility (Rippey, 1973; Cohen and Garet, 1975). Another school cites evidence that evaluative information not only can be useful, but that it has been used to influence decision making (Patton, et al., 1975; Alkin, et al., 1974; Alkin, Daillak and White, 1979). In a 1975 study, the difference between useful and non-useful information was seen to be dependent on whether some individual takes the responsibility of getting the information to the right people (Patton, et al., 1975). A 1979 study of evaluation utilization in five school districts showed that in three of the districts studied, evaluation had a profound influence on critical program decisions: in one, utilization was very important; in the fifth, it had some use (Alkin, Daillak and White, 1979).

A number of methods have been devised to describe and analyze factors that influence evaluation utilization (Alkin, 1975; Cohen, 1977; Patton, 1978). Braskamp and Brown (1980) assert that no matter what factors are present, effective information utilization is possible only if evaluators become better administration helpers, if administrators become more interested and if the interface between the two is strengthened.

One theory of decision making is linked directly to information utilization (Kimbrough and Nunnery, 1976). The theory suggests that decision making is a four-stage process: recognition of the need for a decision, designing the decision, selecting an alternative and taking action (Stufflebeam, et al., 1971). Information or data gathering is not identified as a separate step because it is integral to each step. Their work is partly based on the work of Braybrooke and Lindblom (1970) and their consideration of public policy making (Stufflebeam, et al., 1971).

Over the years, several evaluation models have been described and developed to support decision making in its many settings (Provus, 1969; Scriven, 1967; Stake 1967; Stufflebeam, 1968; Stufflebeam, et al., 1971; Worthen and Sanders, 1973). The common thread running through these diverse descriptions is that informed decisions can only be made if valid information is generated to support decisions, if the information is utilized in making the decisions and if the decisions are consistent with the information (Worthen and Sanders, 1973). This thinking is consistent with Patton's (1978, 1981) assertions that evaluation should be focused on utilization and that evaluation designs should be situationally responsive rather than methodologically rigid.

An understanding of the rationale for evaluating vocational education programs is necessary before any model can be applied. Vocational education programs are evaluated for a number of reasons. These reasons may be classified into three broad categories:

1.0 To document attainment of program objectives.

2.0 To provide information for program operation and development

3.0 To provide information for program modification

These categories may contain overlap and different evaluation strategies have been utilized to serve the various reasons for evaluation. More than one strategy may be employed to evaluate for more than one of the cited reasons.

Accountability, one of the reasons for evaluating vocational education programs, is required by law. The Educational Amendments of 1976 (P. L. 94-482, U.S. Congress, 1976), which completely rewrite the Vocational Education Act of 1963, stipulate 28 evaluation activities which must be carried out by local, state and federal education agencies (U.S. Congress, 1976; Wentling, 1980; Florida Department of Education (FDoE), 1981a).

Among these activities is the requirement that states evaluate the effectiveness of each local program which is operated for the purpose of providing program completers with entry-level job skills (U.S. Congress, 1976; the applicable subsection may be found in Appendix 5). Typically, state and local agencies meet this requirement by

conducting two kinds of evaluation: program review and follow-up studies (Cochran, Phelps and Cochran, 1980; Wentling, 1980).

Program review is conducted in Florida in accordance with the requirements and criteria set forth in the **Florida State Plan for Vocational Education** (FDoE, 1977). Self-studies and on-site visits are conducted. Following a self-study by program personnel, an on-site visit is conducted by a team of Florida Department of Education consultants who evaluate the program by observing its operation and utilizing an instrument developed by the department for this purpose (FDoE, 1981b, 1983).

Follow-up studies of program completers and program leavers are specified in Florida law (Florida Legislature, 1980; the applicable sections may be found in Appendix 6). A random sample of program completers and leavers are surveyed to determine the effectiveness of local vocational education programs. A staff of specially trained occupational specialists conduct these studies in each school district.

This pattern of vocational education program evaluation is used in a number of other states (Luftig, et al., New Hampshire, 1976; Daugherty and Suzuki, Alaska, 1979; Edington and Cruikshank, Wisconsin, 1979; Smith, Illinois, 1979; Field, Kansas, 1978). There are a number of other ways to evaluate vocational education programs but these approaches are the most prevalent.

The federal vocational education law and the Florida plan contain another requirement related to program development and evaluation. School districts are required to maintain committees which are to advise the districts on job needs and the relevance of the programs being offered (U.S. Congress, 1976; FDoE, 1977). In order for these committees to advise on program relevance, it is necessary for them to gather data about the programs. No systematic methodology is used in Florida to gather these data.

Tied to this advisory committee function is another focus which has gained emphasis in Florida in the past two years. The administration and legislature have determined that a viable means of providing for increased economic development for the state centers around the recruitment of commerce and industry which will increase the state's tax base and decrease dependence on agriculture and tourism. The

targeted industries are selected to neither drain Florida's natural resources further nor to further pollute the state's natural environment. The kinds of business being recruited include financial, pharmaceutical, medical instrumentation, aviation and aerospace, communications and data processing industries which are highly oriented toward rapid technological development (Florida Department of Commerce, 1981).

High technology commerce and industry depend heavily on a well trained labor force: workers who can enter employment with the skills to perform the duties for which they are hired and with the ability to continue their professional growth to meet the demands of rapidly changing technology (Robinson, 1979; Klein, 1980). If states, including Florida, are to improve and maintain high quality vocational education systems, the industries which hire their graduates must be called upon to help (Hendricks, 1980; Bottoms, 1981).

Program advisory committees are supposed to be selected from among personnel who can advise the operators of vocational education programs. As such, these committees can provide valuable assistance in program evaluation (American Vocational Association, 1969; Burt, 1971; Riendeau, 1977; FSACVTE, 1979a, 1979b, 1981; Wentling, 1980). This is particularly true in states such as Florida where the technology advances so rapidly that public education agencies are hard pressed to keep up.

Advisory committee program evaluation is well established in the literature. Program evaluation has been seen as one of the most important functions of advisory committees Nance, 1975; Cochran, Phelps and Cochran, 1980; Wentling, 1980). In Kentucky, advisory committees have been given major responsibility in this area (Kentucky State Board of Education, 1976). Michigan committees evaluate each local program every three years (Michigan Vocational-Technical Education Service, 1977). Members of Illinois committees serve on evaluation teams which evaluate local programs each five years (Illinois Office of Education, 1976).

The Florida State Advisory Council on Vocational and Technical Education has recommended expanded use of advisory committees in local program evaluation (FSACVTE 1979a, 1979b, 1981). Advisory committee members can fulfill their roles as program evaluation consultants in their multiple capacities as committee members,

external experts, training professionals, employers of graduates and simply as citizens (Mantling, 1980).

A 1975 University of South Florida study revealed advisory committee accomplishments and also pointed to a need for improvement. Danenburg, Keene and Miller (1975) analyzed 275 questionnaires from advisory committee members and vocational educators in Florida school districts and community colleges. They found that a discrepancy existed between how effective the committee members perceived their committees to be and the degree to which the committees were actually performing the activities indicative of effectiveness (planning, implementation and evaluation). Over 75% of the respondents reported that their committees were effective, but the highest rate of practice reported was 43% for implementation. The lowest was 34% for evaluation practices.

The study also found significantly strong associations between practice and effectiveness for three planning practices, five implementation practices, and five evaluation practices. The five evaluation practices were comparing program accomplishments with program objectives, assisting in evaluating graduates' job performance, reviewing course content, assisting in evaluating student performance in school and reviewing equipment and facilities.

Among the recommendations of the study were that attention be given to improving committees' performance in planning, implementation and evaluation and that the committees should, to a greater extent, review placement and follow-up information.

In a needs assessment conducted in Michigan, 41 activities of advisory committees were ranked by vocational education administrators as to importance "in theory" and "in practice." Review of facilities and equipment was ranked as the most important activity in theory for both secondary and post-secondary schools. In practice, it was ranked second of 41 for both levels. In the same study, administrators and school board members outside vocational education were surveyed as to their perceptions of the involvement and effectiveness of local committees on eight criteria including program evaluation. Ninety-three percent of the respondents perceived a moderate or higher extent of **involvement**. Forty-six percent thought that committee **effectiveness** in program evaluation was satisfactory. Thirty-three percent responded that **effectiveness** was more than

satisfactory (Cochran, Phelps and Skupin, 1974).

In a Florida study, Fishkind, Milliman and Betancort (1977) concluded that there was a lack of involvement on the part of advisory committees in Florida in program planning, implementation and evaluation. A 1978 Florida study, conducted by the Florida State Advisory Council on Vocational and Technical Education, showed that local program advisory committee members tended to rate their committees as effective, but the majority of persons surveyed responded that their committees were not involved in program planning (70%), implementation (77%) and evaluation (64% (FSACVTE, 1979). As a result of these studies, the Florida Department of Education (1982, 1983) has recommended expanded use of advisory committees in program evaluation.

In summary, program evaluation is substantiated as a legitimate activity for program advisory committees, in general as well as in Florida. Local advisory committees are required by law and a structure is in place in the state. It should be noted that formal program evaluation by local committees is not required, but these committees are required to advise on the relevance of the programs offered. Advisory committee participation in program evaluation is well substantiated in theory as well as in practice. This use of advisory committees needs improvement in Florida and is critical to the current thrust of the economic development of the state. What is lacking is a system to be used by advisory committees in conducting evaluations. The purpose of this document is to develop such a system.

Silvern (1971) has observed that systems thinking and systematic development in educational thought has evolved erratically since the turn of the twentieth century. He has concluded that two overriding processes make up the systematic development of anything. The two processes are analysis and synthesis, which he has combined into the word "anasynthesis." This iterative process makes up the substance of a systems approach (Silvern, 1971). From this process, Silvern has devised a model for producing a system. In it, existing information is analyzed. From this analysis, a new object is synthesized. The new object is developed into a prototype or model. The model is tested, evaluated and revised. Following the revision, the final system is fabricated. Once fabricated, the system can be maintained or eliminated (Silvern, 1971).

Utilizing a systems approach to evaluation or to any management function in an organization is well established in the literature (Berrien, 1968; Buckley, 1968; Kaufman, 1972). Van Gigch has observed that the scientific method of experimentation has served well, but that a different approach to management and organizational functions can complement the science paradigm (van Gigch, 1978). He proposes an approach which can provide an analysis of organization and process systems as they relate to other systems with which they interface (van Gigch, 1978).

Kaufman and English assert that the utility of any output, process, input or product can best be determined by evaluating it in terms of its impact on systems external to it (Kaufman and English, 1979). It would be difficult to identify a branch of education which has a more immediate impact on an external system than vocational education. Bringing the vocational education system into closer alignment with the business and industry system can more effectively achieve common goals.

Kaufman, Knight and Watson have developed a model for delivering vocational education in Florida utilizing a systems approach. The system developed, the Competency-Based Vocational Education System (CBVES), includes a model for assessing the needs of vocational educators with respect to a set of professional competencies needed to deliver competency-based vocational education (VENAP). The VENAP system provides for the logical, rational assessment of the needs of instructors in this area (Kaufman, Knight and Watson, 1981).

It is appropriate then, to develop a model for evaluating vocational education programs utilizing a systems approach. This approach is not intended to supplant experimental inquiry. Its purpose is to enhance understanding of the relationship between two separate but related systems in a manner which complements the knowledge gained through the empirical method.

SOLUTION STRATEGY AND SPECIFICATIONS FOR EVALUATION MODEL

Solution Strategy

The preceding section attempted to identify and validate the need for a program advisory committee evaluation system. This validated need is based upon the following premises:

1. That advisory committees exist to provide information to the operators of vocational education programs.
2. That one of the primary methods of generating this information is through the evaluation of the programs.
3. That the output of these advsiory committees is not as useful and uniform as it should be.

These premises have led to the conclusion that there is a need to develop a set of guidelines, protocols and procedures for advisory committee program evaluation.

The solution to the problem is the development of a system for advisory committee evaluation of vocational education programs. The Program Advisory Committee Evaluation System (PACES) is intended to provide program decision makers with data to improve those programs, enhancing the ability of those programs to meet specified objectives.

Specifications of the Evaluation Model

The intended output of this effort is to develop a model of an evaluation process which will generate evaluative information related to vocational education programs. Essentially, evaluation involves the following processes:

1. Delineating information; specifying the kinds of information to be considered; focusing information requirements.
2. Obtaining information; collecting, organizing and analyzing information.
3. Providing information; fitting together the information that serves the purpose of the evaluation; communicating the information to decision makers.

The model developed is for an iterative evaluation system to be utilized by program advisory committees for the purpose of assisting decision makers responsible for vocational education programs in evaluating those programs. The model consists of four major components or subsystems: advisory committee evaluation team training, data gathering, data organization and analysis and communication of findings.

The system is known as the Program Advisory Committee Evaluation System and is identified by the acronym PACES. PACES may be viewed in its proper context as a subsystem of a larger system. In it, the instructional program and the mechanism for its modification may be viewed as related subsystems. PACES may also be viewed as a complete system in which program operation and program modification become parts of its environment.

The aim of this study is neither to develop an instructional program nor to prescribe actions on the part of decision makers for its modification. The aim is to provide a means for supplying decision makers with information to enable them to make program decisions on the basis of valid, comprehensive information. The evaluation system cannot, however, be considered in isolation. Its environment, the systems with which it interfaces, must be considered as well.

1.0 **Provide Instructional Program.** The programs are courses of study in the areas designated in Florida as job-preparatory vocational education. They are designed to provide students with the skills and attitudes necessary to seek, obtain and hold employment in modern business and industry. The programs are provided in area vocational-technical centers, junior and community colleges and in comprehensive high schools.

1.1 **Determine Program Need.** The school district or community college will determine, before a program is initiated, that a need for it exists. This need is determined by the needs of the labor market. The evaluation system will be designed to provide data relative to this concern.

1.2 **Establish Program Objectives.** Objectives are the framework of an instructional program. Whether the objectives are congruent with industry needs and practices is critical to the value of the instructional programs.

1.3 **Operate Program.** The curriculum and instruction of the program will largely determine the employability of the students. The evaluation system provides data to enable program operators to better prepare students for their future roles in business and industry. Curriculum and instruction are viewed from the standpoint of current and future industry and commerce needs and practices and not from the standpoint of learning theory. The evaluation teams will be expected to possess expertise in their fields, but not in the constructs of educational theory.

1.4 **Attain Program Objectives.** Whether a program attains its objectives will be the final consideration.

2.0 **Evaluate Instructional Program.** Evaluation, in this model, consists of the application of the Program Advisory Committee Evaluation System. The protocols and manual are followed by the members of the advisory committee evaluation team. This is not, of course, the only method of evaluating a vocational education program. This method of evaluation is intended to complement other methods, not to support them. The PACES subsystems are depicted in Figures 3 through 6.

2.1 **Train Advisory Committee Evaluation Team.** Prior to the implementation of PACES protocols, the advisory committee will receive instruction in the operation of the system.

2.1.1. **Conduct Committee Orientation.** A PACES trainer will conduct an orientation meeting of the advisory committees using the system. The Working Protocols and the Manual will be introduced and explained.

2.1.2 **Conduct Self-Study.** The committee members will be given the Working Protocols and Manual to study at their leisure. They are to study these materials and return for a feedback and review session.

2.1.3 **Conduct Feedback and Review Session.** The PACES trainer will conduct a second meeting at which the materials will be reviewed. Any questions or lack of understanding on the part of committee members will be answered and explained.

2.2 **Gather Evaluative Data.** On-site visitation and observation of the instructional program comprises the data-gathering strategies. The committee members will be required to spend time observing the program operation. While observation times will vary with programs, guidelines are included.

2.2.1 **Examiner Program.** Observation includes close scrutiny of tools, equipment and instructional materials. Other strategies include interviewing administrators, instructors and students and reviewing program documents.

2.2.2 **Implement Data Gathering Protocols.** Data-gathering protocols will be followed and information will be recorded in accordance with the specifications found in the protocols. The committee may work as a team or the members may use worksheets to gather and record data, transferring the data to the final set of data-gathering documents. The protocols are the heart of the system. They are highly structured to allow for uniformity across programs and across time and situation.

2.3 **Organize and Analyze Data.** Protocols for reaching committee consensus and summarizing findings have been developed. This allows for the findings to be communicated in a logical and uniform manner.

2.3.1 **Reach Committee Consensus.** The members of the evaluating committees will arrive at a consensus judgment for all standards on which the program is evaluated. The committee will be charged with the responsibility of providing a consensus judgment. Whatever meetings among committee members need to be held for the committee to reach consensus will be a part of the evaluation process. Discussion to consensus has long been valued as a group decision making tool (Baird, 1937; Phillips, 1966). Reasons for this have been seen to be that since group decisions often affect people outside the group, a high degree of interpersonal agreement is desirable and that there is a natural tendency of people in groups to move toward common positions (Gouran, 1974).

2.3.2 **Prepare Group of Substandards and Solutions.** All conditions found to be below standard will be summarized utilizing protocols developed for this purpose. Recommendations for solving substandard conditions will likewise be summarized. This will allow for the communication of the findings in a concise manner.

2.4 **Communicate Findings.** The communication of the evaluation findings makes up the final subsystem of PACES. Findings will be communicated by means of a written report and meetings with instructors and administrators.

2.4.1 **Produce Written Report.** The report will consist of the summaries of all aspects of the program not meeting standards. Included will be the committee's recommended solutions. The report will be structured so that no program deficiency can be reported without the inclusion of a recommended solution.

2.4.2 **Meet with Instructors.** The system includes a provision for the committee to meet with the program instructors to discuss the findings. These meetings would typically be held prior to the final meetings with administrators. This part of the system can be modified, at the discretion of the administrators, and the instructors can be included in the final meetings or if deemed appropriate, can be excluded from the communication process, allowing the administrators to communicate the findings to the instructors.

2.3.3 **Meet with Administrators.** The final, structured meeting takes place between the evaluating committee and the school and/or district administrators. This is the final step in the evaluation process which involves the advisory committee. Once they receive the findings, the administrators are free to utilize the data in whatever manner they see fit.

3.0 **Modify Program.** The modification of programs is a critical factor in providing the desired quality of workers for the labor market. It is a primary focus of program evaluation. It is not, however, within the scope of accepted advisory committee functions (FSACVTE, 1979b).

FINDINGS OF MODEL VALIDATION

The validation of the PACES model was a two-stage process: critical examination and tests of operational feasibility. The critical examination was conducted by submitting system documents to six classes of examiners. System documents and questionnaires were submitted to three groups of examiners expert in the fields of vocational education administration, program advisory committees and business and industry practices. A fourth group consisted of educators involved in a pre-field-test simulation. The two final groups, from whom unstructured responses were solicited, were a group of experts in program evaluation and systematic design and the group of professors supervising the dissertation.

The tests of operational feasibility were conducted in two school settings. Three groups responded to questionnaires: advisory committee members, instructors and administrators.

Findings of the Critical Examination

The vocational education administration response group consisted of 14 members. Of these, seven returned completed questionnaires. Their responses to the nine questions are indicated in Table 1. In those cases where negative responses were given, a discussion follows:

TABLE 1
Questionnaire Responses from Vocational Educational Administration Response Group

Item	Response	
	Yes	No
1.1 Appropriateness of standards	5	2
1.2 Generic nature of standards	6	1
1.3 Comprehensiveness of standards	6	1
2.1 Clarity of Working Protocols	7	0
2.2 Appropriate ordering of subsystems	7	0
3.1 Clarity of instructions	7	0
3.2 Necessity & sufficiency of instructions	7	0

Item	Yes	No	Partially
4.1 Usefulness of information	7	0	0
4.2 Appropriateness of form of information	5	0	2

Question 1.1 was concerned with the appropriateness of the PACES standards. Two of the critical examiners in this group indicated that some of the standards were not appropriate. Both examiners were concerned with the number and complexity of standards dealing with program objectives and student performance objectives. Originally there had been six separate standards dealing with program objectives and four dealing with student performance objectives. The examiners recommended reducing and simplifying these standards, pointing out that advisory committee members are not expected to possess expert knowledge in the area of educational objectives.

Question 1.2 dealt with the generic nature of the PACES standards. One critical examiner indicated that not all programs would need all safety standards. The point is acknowledged. However, it should be

noted that the Manual and Working Protocols provide specific instructions as to how standards not applicable to a program should be treated.

Question 1.3 was concerned with the comprehensive nature of the standards as they applied to legitimate evaluation by advisory committees. One examiner indicated a need for a standard dealing with student achievement and evaluation. This issue has been broached by advisory committees in some states, but it is or can be considered to be in the domain of instruction. In Florida, the instructional or teaching process is prohibited from consideration by advisory committees (FDoE, 1982, 1983).

Question 4.2 dealt with the appropriateness of the form in which evaluation information is provided to administrators. Two of the examiners rated the form as partially appropriate. The comments were that the report would require a lot of reading time and that each element (apparently each group or category of standards) could be color-coded to distinguish between categories.

The PACES report format is designed specifically to minimize reading time. Only those pages dealing with unmet standards are extracted from the Working Protocols package and incorporated into the report. Both preparation time and reading time are minimized. The discussions of sub-standard conditions and recommended solutions are highly structured for the purpose of keeping the committees on task. Most programs would be expected to meet most of the standards. Therefore, in reading a PACES report, an instructor or administrator would need to consider only a few areas in which the committee believes the program is in need of improvement. Color-coding the categories is a suggestion to be seriously considered. Seemingly, it would improve the organization and packaging of the system. Its only obvious drawback would be that large in-house duplication of worksheet copies by a school would be impaired.

General comments centered around the extensive detail in which the programs are evaluated and the time required by an advisory committee to fully implement a PACES evaluation. The tests of operational feasibility which followed the critical examination added further evidence that a PACES evaluation would take more time than had been originally assumed. Modifications made in the system to accommodate this knowledge are discussed below.

The vocational education program advisory committee response group consisted of ten members. Of these, six returned completed questionnaires. Their responses to the eight questions are indicated below. In those cases where negative responses were given, a discussion follows:

Question 1.0 was concerned with the appropriateness of the structure of the system. One examiner stated that other personnel (counselors, occupational specialists, other instructors) should be included in the meetings in which the findings are presented. While PACES instructors do not specifically require the inclusion of these personnel, administrators are encouraged to include those that they deem appropriate in a particular setting. PACES is designed to allow as much school-specific flexibility as possible without compromising the integrity of the system.

TABLE 2
Questionnaire Responses from Program Advisory Committee Response Group

	Response	
Item	**Yes**	**No**
1.0 Appropriateness of system structure	5	1
2.0 Appropriateness of system focus and scope	6	0
3.1 Clarity of Working Protocols	6	0
3.2 Appropriate ordering of subsystems	6	0
4.1 Clarity of instructions	6	0
4.2 Necessity and sufficiency of instructions	5	1

Item	**Yes**	**No**	**Partially**
5.1 Usefulness of information	6	0	0
5.2 Appropriateness of form of information	5	0	1

n = 6

Question 4.2 dealt with the necessity and sufficiency of the instructions and explanations. One examiner pointed out that, in PACES, the advisory committees are asked to provide a great deal of information in making recommendations (e.g., cost and publisher of instructional materials). Instructions in the final version of the PACES Manual are more explicit than those in the critical examination draft in pointing out that these kinds of data are requested with the recognition that the committees may not be able to supply all of this information in all cases. Recommendations should be as specific as possible without placing the committee under an undue or untenable burden.

Question 5.2 was concerned with the appropriateness of the form in which information is provided to administrators. One examiner recommended the inclusion of a summary of program strengths and weaknesses in the PACES report. The report is designed for simplicity, ease of preparation and minimization of reading time. A one-page checklist of program strengths and weaknesses is provided with each PACES report. The reader is then directed quickly to the areas of concern identified by the advisory committee. The PACES model has never been intended to serve as a tool for self-congratulation.

General comments by this group clustered in four areas: the largeness of the scale of the system and the time required, the use of the word "substandard," the necessity for proper training and the point-numeric numbering system. Each of these issues has been addressed and modifications have been made in the system.

The original critical examination draft assumed that a PACES evaluation could be accomplished in a one-site-visit frame. The advisory committees would be given the complete package and asked to go through the Working Protocols all at one time. The field tests raised additional questions about the feasibility of this strategy. The system's instructions have been modified to allow for more time for the total evaluation to take place and for the committees to consider one category of standards at a time.

In the critical examination draft, the word "substandard" was used nominatively to denote a condition in which a program did not meet a particular standard. A number of the critical examiners and casual

reviewers felt that this use of the word was confusing and inappropriate. The tests of operational feasibility proved that this concern was well founded. The term "substandard condition" was substituted on the recommendation of field test personnel and other examiners. A further discussion is included in the results of the tests of operational feasibility.

The critical examiners pointed out that the proper training in the use of the PACES materials was a key to the successful implementation of the system. In the final revision the training subsystem was afforded more attention and was formalized to a greater degree than it had been in the original draft.

The point-numeric numbering system employed throughout the PACES materials was an area of concern to one examiner. An explanation of this system has been included in the final version of the PACES manual.

The business and industry practices and current technology response group consisted of 13 members. Of these, six returned completed questionnaires. Their responses to the six questions are as follows. In those cases where negative responses were given, a discussion follows:

Question 1.1 was concerned with the consistency of the standards with current practice and current technology. One examiner recommended the inclusion of standards regarding shop inventory control and instruction in the safe operation of machinery. Both of these areas fall within the realm of teaching and instructor behavior. As an earlier discussion indicates, these areas are purposely excluded from consideration in PACES.

Question 1.3 dealt with the completeness of the standards as related to the need for a trained work force. One examiner recommended that standards be added to evaluate the practice for job interviewing and job hunting in a vocational education program. One examiner recommended standards dealing with the use of quality circles and participative management in vocational programs.

TABLE 3
Questionnaire Responses from Business and Industry Practice Response Group

Item	Response	
	Yes	No
1.1 Consistency of standards with current business practice and current technology	5	1
1.2 Generic nature of standards	6	0
1.3 Completeness of standards	4	2
1.4 Clarity and conciseness of standards	6	0
2.1 Ability of system to communicate needs of business and industry	6	0
2.2 Likelihood that use of system will improve product of vocational education	6	0

n = 6

Job placement services and employability skills training may be included as a part of a particular vocational education program. In many Florida schools, however, these responsibilities are delegated to cooperative education coordinators, guidance counselors, occupational specialists, Individualized Manpower Training Systems learning centers or to other programs and individuals (FDoE, 1983). If an advisory committee perceives the need for such standards in a particular program, a provision is made in PACES for the inclusion of committee-generated standards.

While participatory management and quality circles are on the rise in American business and industry (Watson, 1982), their emergence in education is in its infancy (Bellanca, 1982). Vocational education programs most often prepare students for entry-level employment (FDoE, 1983). Quality-circle and participatory management techniques would seem to be beyond the entry-level skills required in a beginning employee, particularly an employee entering a company

which has not yet adopted these philosophies. Certainly, standards may be added by advisory committees, instructors or administrators deem them to be appropriate in a particular program or a particular school. PACES provides a method of adding program- or school-specific standards to the system. However, the inclusion of basic PACES standards in management philosophies not yet firmly entrenched in American business would be premature.

Quality circle and participatory management techniques as a part of vocational education programs, would constitute tasks much like any other tasks taught in a program. The system already provides for the evaluation of the tasks included in a program, together with the program objectives and student performance objectives which are consistent with those tasks. An advisory committee may recognize that tasks on quality circle and participatory management techniques are appropriate in a particular program. If so, the committee can recommend the addition of program objectives, tasks and student performance objectives in these areas.

General comments from this group, not elsewhere discussed were centered around the issue of instructor evaluation and the specific judging of instructional technique. It was stated that the exclusion of standards in these areas limited the system's utility. While this may be a valid point of consideration, an earlier detailed discussion explains the reasons behind the deliberate exclusion of these topics.

The pre-field-test simulation group spent more than six hours over a three week period reviewing the system documents and simulating a PACES evaluation in a business education laboratory in an adult vocational school in Hillsborough County. Their comments focused generally on three issues: the time required for a PACES evaluation, the evaluation of teaching and the number and complexity of standards in the areas of program objectives and student performance objectives.

The group did not believe that it was feasible for an advisory committee to implement the PACES system within the framework of one site visit. Their recommendation was to conduct the evaluation in segments, possibly spreading the total project over a year. Final modifications made in the system allow for this to be done. The instructional materials recommend that the committees be given all of

the materials at the beginning, but that the on-site visits be spread over a period from three months to one year, depending on the situation in a particular school or program.

The group was emphatic that the evaluation of teachers and instructional technique was not appropriate in this context. Their reasons included legal constraints, lack of cooperation by teachers and possible morale problems. Their input reinforced the exclusion of teacher evaluation from PACES.

It was the consensus of judgment by this group that the critical examination draft of the system contained too many standards on program objectives and student performance objectives. It was their belief that state and school district evaluation of programs have adequately addressed the appropriate issues with the exception that PACES needs to evaluate these areas with regard to industry practices and current technology. The final revisions in the model have done exactly that: six standards on program objectives have been refined to one and four standards on student performance objectives have been refined to two.

Each member of the group to whom the PACES materials were submitted for an unstructured critical examination offered comments and suggestions. These comments and suggestions covered a number of issues and topics. A great many concerned the language used in the Working Protocols and Manual and were invaluable to the final editing of these documents in maximizing the precision of the language used.

One body of comments concerned the specific delineation within PACES documents of the distinction between advisory committee members as program evaluators and program evaluators who are professionally trained in program evaluation theory and technique. The critical examination drafts were less specific than the final documents in making that distinction.

A great many examiner comments addressed the place of the Program Advisory Committee Evaluation System among established models for program evaluation. These comments and suggestions contributed greatly to the earlier chapter devoted to this topic. Originally, it was attempted to fit the PACES model precisely into an existing overall model for program evaluation. It became evident that

PACES did not fit, in purpose or design, within boundaries as narrow as one specific model. This group of critical examiners facilitated drawing on several models, defining the fit of the PACES model within these diverse models with greater precision.

The final group of critical examiners was the doctoral committee supervising the development of PACES. The kinds of comments and suggestions made by these examiners resembled those made by the previous group. This committee reviewed and approved all modifications made in the system.

Findings of the Tests of Operational Feasibility

Three response groups evaluated the model: advisory committee members, instructors and administrators. Eleven advisory committees were involved in the tests. These committees ranged in number of members from five to eleven. Eighteen completed questionnaires were returned by advisory committee members. As indicated above, four of the committees were unable to find sufficient time to complete the activities of the tests. Some of the members of the committees who were able to complete their activities did not find sufficient time to complete questionnaires. Responses received are indicated in Table 4.

As the data indicate, the magnitude/time frame and the training emerged as the areas of greatest concern. These themes were dominant throughout the validation studies. These issues are addressed in detail in the section titled Model Revision-Conclusions and Discussions.

Eleven programs participated in the tests of operational feasibility. The number of instructors in these programs ranged from one to six. The total number of instructors involved was 25. As previously indicated, four programs were unable to complete the activities of the field tests. Sixteen questionnaires were completed and returned. Responses received are indicated in Table 5.

This group added to the body of evidence which indicated that up to one year should be allotted to PACES evaluations. While one of the specific comments indicated that a minimal amount of time should be required, group consensus seemed to indicate that the original time frame specified would not, in practice, be sufficient.

This group did not indicate that the training provided to the committees was adequate. However, their responses overall were not emphatic that the training was adequate. Since the advisory committee members were strongly in favor of an expanded training subsystem, this modification in the system has been made.

Four of the instructors commented that advisory committee members would have to be dedicated to their agreements to serve in order for the system to be effectively implemented. This theme recurred in comments received from other groups. While it is recognized that few advisory committees are apt to behave in an ideal manner, no evaluation system of any merit could assume that members of advisory committees would be expected to fail utterly in the performance of their duties.

Of the five administrators who had more than a perfunctory exposure to the system, three returned questionnaires. Two from one school and one from the other responded. Their responses are indicated in Table 6. While the small number of respondents dictates that any generalization of findings be made with caution, it is noted that no pattern of disagreement with questionnaire statements emerged. The only comments made by administrators were that the system is needed and that it can provide valuable information in decision making, but that sufficient time would have to be given to advisory committees and instructors in implementing it.

TABLE 4
Questionnaire Responses from Advisory Committee Members

	Item	Strongly Agree	Agree	Disagree	Strongly Disagree
1.1	Standards are appropriate	13	5	0	0
1.2	Standards are stated clearly	16	1	0	0
1.3	Documents are easy to use	8	8	0	0
1.4	Documents are appropriate to standards	10	8	0	0
1.5	Recommendations structure is appropriate	5	13	0	0
1.6	Committee's training was adequate	4	4	10	0
1.7	Communication subsytem is appropriate	11	7	0	0
1.8	Communication subsystem is sufficient	6	12	0	0

Table 4 (cont'd).

2.0 Amount of time required to implement system.

One week	0	Four to six months	1
Two weeks	0	One year	11
One month	4	Other	0
Two to three months	2		

3.0	Most efficient method of implementing system.	
	Consider all standards at one time	5
	Break down into eight groups	13
	Other	0
4.0	Should "substandard" be used as a noun to indicate a condition in which a program does not meet a standard?	
	"Substandard" should be used as outlined	10
	"Substandard condition" would be more appropriate	8
	Other	0
5.0	Adequacy of standards on program objectives and on program tasks/student performance objectives.	
	Standards 1.0, 2.1 and 2.2 are adequate	17
	Additional standards need to be included	0

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n = 18

TABLE 5
Questionnaire Responses from Instructors

	Item	Strongly Agree	Agree	Disagree	Strongly Disagree
1.1	Standards are appropriate	5	10	0	0
1.2	Standards are stated clearly	9	7	0	0
1.3	Documents are easy to use	10	6	0	0
1.4	Documents are appropriate to standards	11	5	0	0
1.5	Recommendations structure is appropriate	8	8	0	0
1.6	Committee's training was adequate	5	10	0	0
1.7	Communication subsystem is appropriate	4	12	0	0
1.8	Communication subsystem is sufficient	3	10	3	0
1.9	Information is useful to instructors	5	11	0	0
1.10	Information is in a useable form	5	10	0	0

Table 5 (cont'd).

2.0 Amount of time required to implement system.

One week	1	Four to six months	2
Two weeks	2	One year	6
One month	4	Other	0
Two to three months	1		

3.0	Most efficient method of implementing system.	
	Consider all standards at one time	11
	Break down into eight groups	5
	Other	0
4.0	Should "substandard" be used as a noun to indicate a condition in which a program does not meet a standard?	
	"Substandard" should be used as outlined	6
	"Substandard condition" would be more appropriate	10
	Other	0
5.0	Adequacy of standards on program objectives and on program tasks/student performance objectives.	
	Standards 1.0, 2.1, and 2.2 are adequate	16
	Additional standards need to be included	0

n = 16

TABLE 6
Questionnaire Responses from Administrators

	Item	Strongly Agree	Agree	Disagree	Strongly Disagree
1.1	Standards are appropriate	2	1	0	0
1.2	Standards are stated clearly	2	1	0	0
1.3	Structure for committee recommendations is adequate	3	0	0	0
1.4	Committee's training was adequate	2	0	0	0
1.5	Findings communication subsystem is appropriate	3	0	0	0
1.6	Findings communication subsystem is sufficient	3	0	0	0
1.7	Information generated is useful to administrators	3	0	0	0
1.8	Information is provided in a usable form	3	0	0	0

Table 6 (cont'd).

2.0 Amount of time required to implement system.

One week	0	Four to six months	1
Two weeks	0	One year	1
One month	0	Other	0
Two to three months	0		

3.0 Most efficient method of implementing system.

Consider all standards at one time	2
Break down into eight groups	1
Other	0

4.0 Should "substandard" be used as a noun to indicate a condition in which a program does not meet a standard?

"Substandard" should be used as outlined	2
"Substandard condition" would be more appropriate	1
Other	0

5.0 Adequacy of standards on program objectives and on program tasks/student performance objectives.

Standards 1.0, 2.1 and 2.2 are adequate	3
Additional standards need tobe included	0

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n = 3

CONCLUSIONS AND IMPLICATIONS

The Program Advisory Committee Evaluation System (PACES) was developed to meet a need identified and validated through an evaluation of the literature and current practice. Program advisory committees in vocational education have traditionally been charged with the responsibility of evaluating programs for the purpose of keeping them up-to-date with business and industry practices and current technology. This function of advisory committees has largely been undertaken assuming that they would intuitively arrive at the proper conclusions.

Rapid technological development and accountability requirements have led to state mandates that the advisory committee evaluation be given closer attention. Through an evaluation of the literature and practice, it was learned that there is a lack of systematic methodologies for advisory committees to use in evaluating programs. PACES was developed to fill this gap.

The PACES model was developed through a systems approach to the problem. The model was conceptualized through analysis and synthesis of existing information about vocational education, program advisory committees, program evaluation and systems design. The model was validated through critical examination by recognized experts and practitioners and through tests of operational feasibility conducted in school settings. The final PACES model was produced through an analysis and synthesis of the information generated by this validation process.

The model consists of four major functions or subsystems: advisory committee training, data gathering, data organization and analysis and communication of findings. The system is designed to enable advisory committees to evaluate programs on factors found to be within the realm of expertise of advisory committee members, excluding factors which belong to the realm of school, district and state administrators and supervisors.

Certain findings added to the knowledge that producing an advisory committee evaluation system was both worthwhile and timely. The local and state-level administrators and instructors involved at all stages strongly supported the need for a system. Business and industry personnel verified what the literature had shown, that in

order for vocational education to provide well trained workers, communication between the employers and the educational system must be better defined and significantly strengthened. Advisory committee members verified that advisory committees are ready and willing to provide information and other kinds of assistance to vocational education programs if given some guidance and direction. The comment received most often from committee members was that they want to provide information but that they had never known how to go about it.

As stated earlier, the assumption that advisory committees will intuitively arrive at the best conclusions is no longer valid. The Program Advisory Committee Evaluation System provides an alternative to the random fashion in which advisory committees have been functioning PACES isolates gaps between standards and performance and provides a task orientation consistent with the intent of advisory committee operation. It provides a system of procedures which yield information for decision making.

While it was not originally intended to design a system of evaluation which can take up to a year to implement, the development of PACES has provided knowledge which had not been predicted. If it takes a year to fully examine a program, the conclusion follows that the focus of advisory committees should be to conduct such evaluations.

Instead of holding periodic unstructured meetings which have vague purpose, advisory committees can now focus their attention rationally on their purpose. In an attempt to provide them with a method for structuring their inquiry, perhaps a new definition of how they should operate has been discovered and has provided them with a new operational integrity. If this is the case, then the fruits of this attempt have been more bountiful and more fundamental than had, up to this time, been expected.

The validation process showed that the system will, when properly implemented, generate the kinds of program improvement information intended. Certain requirements, however, are necessary for the system's implementation. The advisory committees must be trained in accordance with the outlined specifications. The field tests showed that committee members must be familiar and comfortable with the materials. Otherwise, the system may be perceived as unwieldy and complex. The size of the Working Protocols document

can produce an initial impression of bulkiness if committee training does not illustrate the system's intrinsic simplicity.

To be properly implemented, the system must have the support of senior personnel. By showing these personnel that the system is intended to provide them with information to assist them in improving programs and in documenting their needs, this support can be gained.

The school must have a PACES coordinator who will be responsible for maintaining timelines, answering questions and providing the committees with materials such as worksheet copies. This coordinator must be committed to successful implementation and must be thoroughly familiar with the system. It is through this individual that questions should be resolved. There needs to be agreement between this PACES coordinator and the administration and faculty as to how the system's implementation will be conducted and what the procedural and logistical requirements will be.

The committees must be given sufficient time to implement the system. The field tests showed that because advisory committee members are part-time volunteers who have their own job responsibilities, they cannot be rushed through the process. The model validation showed that an advisory committee may need up to a year to implement the system. It is recommended that the standards be considered in groups, not all at one time. While the system is designed to minimize the burden of work on the committees, some time and effort are required. For this reason, there should be agreement from the onset when each stage will be completed and sufficient time should be given.

The validation studies have shown that the system will, when properly implemented, provide vocational education program operators with information related to the needs of the businesses and industries who employ program completers. This can allow administrators to make program decisions from an informed base in the interest of the students who will be seeking employment in the marketplace.

The inclusion of valid information from business and industry into the decision making process can make vocational education more responsive to the demands of the marketplace. Florida's commitment to attracting new commerce can be strengthened by this knowledge.

If advisory committees are a primary link between industry and vocational education, it follows that companies will view favorably the state's efforts to strengthen this link. This evidence of commitment should improve Florida's attractiveness to companies who may be considering relocating their operations to the state.

Utilizing a systems approach to the development of the PACES model proved to be an effective means of attacking the problem. Outlining the system in terms of processes and developmental stages showing information flow and relationships among subsystems allowed the model building to be accomplished in a manner which integrated the parts and made the whole function as a cohesive unit. Another approach might have been to have each subsystem be designed by a committee of individuals expert in the areas relative to that subsystem and to pull the subsystems together to form the model. In this strategy, each subsystem might have been efficient within its own structure, but no allowance would have been made for how the subsystems interact. No balance would have been achieved between and among the functions.

On the opposite extreme, the system could have been designed by one person, without consulting other individuals. This strategy would not have allowed for the consideration of the needs of the involved personnel groups beyond the perception of the individual designing the system. It would be unrealistic to assume that one individual could possess the knowledge necessary nor the sensitivity to the needs of all groups. A model of this scope cannot focus solely on students, instructors, administrators, advisory committee members, or employers. It must focus on the needs of the vocational education system which includes all of these groups and on the environment in which this system operates.

Involving a large number of critical examiners and field test personnel produced desirable outcomes and imposed certain limitations. By carefully selecting the kinds of experts who would critically examine the system, it was possible to tune or refine the system to address the requirements of the many groups involved in the training and employment of vocational education students. Conducting these types of validation studies produced a wealth of information to be used in revising the model. From a management standpoint, however, this kind of validation requires the commitment of many people. It allows for many breakdown points within the process. Great

cooperation is required from many people at several levels. This cooperation was achieved by allowing each group to see that they had a stake in the process, that the system would benefit them. This is consistent with Mali's (1978) performance-management-by-objectives strategies and with the "team approach" to management science described by Markland (1983).

Overall, the systems approach to the development of the PACES model has produced a system that should provide information intended. It should be more operationally feasible than a system designed by committees and strung together. It should be more practical than a system designed by a single individual. It should contain the positive attributes of both kinds of systems.

One conclusion which might be reached as a result of utilizing this development process is that in such an endeavor, input from individuals at all levels in all involved subsystems should be included. The process should be managed and coordinated by one individual responsible for gathering, analyzing and synthesizing the data. Through this balance, other problems may be approached and other needs met.

Functions other than program evaluation have been identified as appropriate to advisory committees. Publicity, student recruitment and placement are some of these (FSACVTE, 1979a, 1979b; Cochran, Phelps and Cochran, 1980). A systems approach to these functions may be useful in providing guidance and direction to advisory committees. For example, the systematic development of a placement model could solve student deficiencies in employability skills (attendance, punctuality, interviewing, filling out applications, etc.) and enable those skills to meet the expectations of employing organizations.

Other types of advisory committees, such as those serving adult and community schools could utilize the basic PACES model in evaluating the programs they serve. Appropriate standards and protocols could be developed, adapting the model to fit these programs.

Clark and Guba (1965) have identified three stages for the diffusion of research knowledge and developed products: dissemination, demonstration and adoption. Several additional research strategies are recommended for the PACES model consistent with their

conceptualization. The system could be further evaluated by experimenting to determine whether PACES evaluation of programs leads to the same conclusions as other evaluation strategies. Other experiments might test the effect of the model on the quality of program completers. Additional development efforts could be undertaken to identify methods of disseminating and demonstrating the system and for facilitating its adoption.

The systematic model building process could be used in developing evaluation systems for programs other than in vocational education. It has been used in designing evaluation strategies for federal programs (FDoE, 1978). A systems approach to model building could be utilized to address other problems. Functional illiteracy might be attacked through a systematic strategy in which information from learning theory, sociology, educational technology and other disciplines are used to build an instructional model. A systematic model might be built on the step-by-step properties of mathematical operations to improve mathematics skills in students. Systematic program design might well be utilized in many areas in education. Further research and development activities are strongly indicated, both in the building of theoretical knowledge about information utilization and in practical approaches to identified problems.

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